

20 June 2023

Consultation: ERP2
Climate Change Commission
PO Box 24448
Wellington 6142

Dear Commissioners

Orion submission on Climate Change Commission draft advice on second draft emissions reduction plan

Introduction

1. Orion New Zealand Limited (**Orion**) welcomes the opportunity to make a submission on the Commission's *2023 Draft advice to inform the strategic direction of the Government's second emissions reduction plan*.
2. In providing our submission, we are commenting on some of the Commission's proposed recommendations and providing some background to our comments. We are not commenting on all aspects. A summary of our submissions is set out below at paragraph 11.

How we fit in

3. We own and operate the electricity distribution infrastructure in Central Canterbury, including Ōtautahi Christchurch. Our network is both rural and urban and extends over 8,000 square kilometres from the Waimakariri River in the north to the Rakaia River in the south; from the Canterbury coast to Arthur's Pass. We deliver electricity to more than 220,000 homes and businesses and are New Zealand's third largest Electricity Distribution Business (EDB).
4. Orion has a fully owned subsidiary, industry service provider Connetics, and together with Orion the two organisations make up the Orion Group. In 2019, Orion Group also established the Energy Academy.¹ The Energy Academy is working to bring the energy sector together to grow New Zealand's talent pool.
5. Central Canterbury is a place of rapid growth and transformation, embracing change and innovation, with Ōtautahi Christchurch at the heart of this diverse and vibrant region. Electricity distribution has always been an essential service that underpins regional, community and economic wellbeing. Our service is vital to the wellbeing and livelihood of the people and businesses who live and operate here. Now, it also has a critical part to play in New Zealand's transition to a low carbon economy. Challenges and opportunities are arising from a combination of our community's willingness to adopt changing technologies, Aotearoa New Zealand's drive for a low-carbon future, and the impact of climate change.

¹ See <https://www.energyacademy.co.nz/>

6. In this context Orion’s Group Purpose of “*Powering a cleaner and brighter future with our community*” is central to all we do. As Aotearoa New Zealand transitions to a low carbon economy, the energy sector has a critical part to play. Orion has established its purpose to be a vital player in that transition for our community and our region. We are focused on helping our community realise its dreams for a future that is new, better, and more sustainable over the long term.

7. To this end, our group strategy is as follows:



8. Three of our focus areas are

- facilitating decarbonisation and hosting capacity at lowest cost,
- investing to maintain a safe, reliable, resilient network at lowest total lifecycle cost, and
- being a force for good in the communities we serve.

9. We are very conscious that we face a rapidly changing and massively different energy environment in the decades ahead. The changing landscape facing Orion is primarily driven by three factors – climate change, new technology and increasing demand for electricity. The increasing demand for electricity is driven by the need to enable decarbonisation at pace, and population growth. While the move from petrol and diesel vehicles to electric vehicles is an important step on the decarbonisation journey, other initiatives will also make significant contributions. Of those, the largest contributors across Aotearoa New Zealand will be conversion of industrial processes and heating from coal to electricity and significant solar and wind generation.

10. Orion, along with Aotearoa New Zealand’s other electricity distributors, has a key role to play in enabling decarbonisation and the electrification of the economy in service of New Zealand’s target for net zero greenhouse gas emissions by 2050. That is why we are one of the founding members of Powering Change, an initiative that sets out progress on New Zealand’s climate change goals and details the collective action of members, who represent a broad cross section of electricity and gas companies.²

² See

https://www.poweringchange.nz/?utm_source=website&utm_medium=article&utm_campaign=ena&utm_content=announcement

Summary of our submissions

11. We summarise our submissions as follows:

- a. **Chapter 8 – Built Environment** - We fully support the Commission’s proposed recommendations 10 and 11, and submit that there should be a further recommendation ensuring collaboration, coordination and integration between infrastructure providers so that there is alignment to achieve our decarbonisation goals.
- b. **Chapter 9 – Energy and Industry** – We somewhat support the Commission’s proposed recommendation 13 but we submit that recommendation should be prefaced by the words “*Ensure appropriate regulatory settings are in place to ...*”. We fully support proposed recommendation 14. We also submit that there should be two additional recommendations. Proposed new recommendation 13A is facilitating and improving data sharing between electricity sector participants and providing for the visibility of electricity network information, to enable network investment for decarbonisation. Proposed new recommendation 14A is encouraging innovation funding to support exploration of complex challenges and foster the development of collaborative solutions and shared insights for electrification.
- c. **Chapter 10 – Forests** – We fully support recommendation 15, and we wish to express our support for native forestry.
- d. **Chapter 10 – Transport** – We somewhat support proposed recommendations 17 and 18, and submit that the recommendation 17 could be amended to provide for rapidly resolving the barriers to scaling up vehicle charging infrastructure *using smart solutions*. Recommendation 18 should be amended so that it refers to developing *integrated policies and* incentives to accelerate the uptake of zero emissions commercial vehicles, including vans, utes and trucks.

Proposed recommendations 10 and 11

12. Two of the recommendations that the Commission is proposing in relation to the built environment are

10. *Implement an integrated planning system that builds urban areas upward and mixes uses while incrementally reducing climate risks.*
11. *Incentivise comprehensive retrofits to deliver healthy, resilient, low emissions buildings.*

13. Orion fully supports these recommendations and provides some comments below. We also suggest adding a further recommendation in relation to collaboration between infrastructure providers. For example,

- 10A. *Ensure collaboration, coordination and integration between infrastructure providers so that there is alignment to achieve our decarbonisation goals.***

Key Themes from these Recommendations

Rethinking urban form

14. We agree that urban form, infrastructure, and buildings are part of the solution to reducing emissions and adapting to climate change, and that the way cities and towns are shaped impacts emissions across land use, transport, buildings, energy and waste.
15. Page 99 of the Discussion Document also refers to the potential misconceptions between land transport projects and urban development. For example,

When undertaking a land transport project, planning responsibility is determined by the type of transportation being developed. While much of the planning occurs at the local government level, state highways sit at a central government level, public transport sits at a regional council level, and other land transport modes rest with local councils.

The majority of urban development, however, is planned and undertaken by the private sector working with local government as a regulator, either at the regional or local council level. This fragmentation does not lend itself to whole-of-system outcomes like emissions reduction. Additionally, Aotearoa New Zealand's transport and development markets both operate primarily on a one-off basis.

16. We think it is important that this planning is joined up and that infrastructure providers are involved from the start. For example, Orion has provided input when the draft Greater Christchurch Spatial Plan (GCSP) was being developed.³ The Plan is aiming to
 - provide a shared view of the key urban issues facing Greater Christchurch and the priorities needed to progress to address them,
 - integrate policy, planning and investment decisions across central and local government, as well as across different legislative functions, and
 - support quality, well-functioning urban areas by identifying areas appropriate for future development and their related infrastructure requirements.
17. The Greater Christchurch Partnership is also looking at a new turn-up-and-go public transport service that would run along a dedicated corridor from the central city north to Belfast and west to Hornby.
18. An integrated planning system must provide for electricity distribution networks. Population growth, and subsequently an increased rate of infill housing and subdivision could significantly affect our network as instead of a low voltage feeder supplying 20 standalone homes, a number could be replaced by multiple apartment units, increasing electrical load and triggering network reinforcement. The cost to upgrade infrastructure to service infill housing in older established areas is typically greater on a per-house basis than the cost to connect a new standalone house in a new subdivision. Infill and intensification require more land to be allocated for transformer kiosks and other infrastructure as a direct result of the greater demand for services. In addition, an increase in residential density requires a

³ See <https://greaterchristchurch.org.nz/urbangrowthprogramme/spatial-plan>

greater focus on line clearances for both high and lower voltage lines where higher density land use inevitably results in an increase in potential for conflict with lines.

19. EDBs, together with local government, will be key entities in delivering decarbonisation. Evidence from the United Kingdom highlights that taking a more locally led, place-based approach can deliver a net zero transition with more local support, better tailoring to local needs, and bring economic and social benefits.⁴ Consequently, given the role of electrification in decarbonisation, this will require increased collaboration and alignment, particularly between local authority / GCSP spatial planning and EDB planning. There will also be an increasing focus on facilitating customer and community engagement and participation.⁵ On this basis, we are proposing an additional recommendation to ensure there is collaboration, coordination and integration between infrastructure providers so that there is alignment to achieve our decarbonisation goals.

Incentivising healthy, resilient and low emission buildings

20. We readily support the proposed recommendation to incentivise comprehensive retrofits to deliver healthy, resilient, low emissions buildings. As the Discussion Document notes, buildings are long-lived, setting emissions patterns for the future and drive emissions in other sectors through demand for materials and fuels. Furthermore, the degree of energy consumption within a building has an impact on our network. The more efficient the building the less demand it places on our infrastructure, and it potentially reduces the overall cost of supply.
21. To better understand home energy use, we have introduced the Orion Home Energy Living Lab to learn about changing household energy behaviours and challenges and share data/learnings more widely. The Living Lab project, setting up and trialling a 'Living Lab' of 15-20 households (starting with Orion Group employees), will help us learn about residential customer's changing energy use and profiles, and future energy use considerations. It will also offer the ability to learn with innovators by trialling new solutions to support an equitable energy transition. We are also working with Otautahi Community Housing Trust (OCHT) on a project to understand energy consumption and environmental factors to help OCHT improve their decision making on building portfolios. It provides tenants involved the opportunity to improve their energy efficiency while maintaining a healthy home.
22. In terms of residential building programmes, we have been a long time co-funder of Community Energy Action's energy efficiency services which support lower income households in Canterbury, including delivery of Warmer Kiwi Homes insulation and heat pumps programme. We have also co-funded (alongside Christchurch City Council and ESSC) EcoBulb's energy assessments and energy efficiency measures of 800 homes in 2022-23.

⁴ See Mission Zero Independent Review of Net Zero Rt Hon Chris Skidmore M, at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1128689/mission-zero-independent-review.pdf

⁵ One example is Te Haerenga (an Energy Academy initiative focussing on energy education). Te Haerenga, is a quest-based journey for tamariki and rangatahi to collaborate on positive energy solutions in service of their community and environment.

Proposed recommendations 13 and 14

23. The Commission is proposing these two recommendations in relation to energy and industry. These are

13. *Prioritise and accelerate renewable electricity generation build and ensure electricity distribution networks can support growth and variability of demand and supply.*
14. *Pursue more widespread process heat decarbonisation and establish mechanisms for other industrial sectors and processes to decarbonise.*

24. Orion **somewhat supports** these recommendations but submits that the following amendments are also needed in order to fill current critical gaps:

13. **Ensure appropriate regulatory settings are in place to** *prioritise and accelerate renewable electricity generation build and ensure electricity distribution networks can support growth and variability of demand and supply.*
- 13A. Facilitate and improve data sharing between electricity sector participants and provide for the visibility of electricity network information, to enable network investment for decarbonisation.**
14. *Pursue more widespread process heat decarbonisation and establish mechanisms for other industrial sectors and processes to decarbonise.*
- 14A. Encourage innovation funding to support exploration of complex challenges and foster the development of collaborative solutions and shared insights for electrification.**

25. We provide some more information below on various aspects of the draft advice as set out on pages 111 to 116, and pages 119 to 125.

Key Themes from these Recommendations

Electrification is key for decarbonisation

26. Electrification is key for decarbonisation. As noted in the Boston Consulting Group's report *The Future is Electric*⁶

Although 82% of New Zealand's electricity is renewable today, only 28% of the country's total energy consumption is met by renewable sources. A large proportion of this non-renewable energy is oil (petrol and diesel) used for transport. Estimates are that the proportion of energy derived from renewable sources will need to be ~50% by 2035 and ~80% by 2050 to reach emissions targets. While every part of the economy must contribute to New Zealand's decarbonisation objectives, the electricity sector can play a critical and substantive role throughout the 2020s across 3 measures:

- *Electrifying transport*
- *Electrifying process heat, and space and water heating in buildings*

⁶ See <https://www.bcg.com/publications/2022/climate-change-in-new-zealand>

- *Increasing the proportion of electricity provided by renewable resources*

With these 3 measures, the electricity sector can reduce emissions from sectors that account for up to 30% of gross emissions, equivalent to ~50% of emissions covered under New Zealand's net zero target (a target which excludes biogenic methane), from 2019 levels by 2050.⁷

27. We recognise that electrification of transport, industry and other activities cannot be achieved without significant investment across the electricity sector. The additional electricity needed in the decades ahead must lead to increased generation, transmission and distribution spend – although in the long-term most consumers will benefit from total energy cost savings across all aspects of their energy use.
28. In *The Future is Electric* report, the Boston Consulting Group stated that distribution spend in New Zealand would need to increase significantly and that distribution sector spend through to 2030 would be more than 50% of the total investment required in the entire electricity industry. And further that

The distribution network will be critical for enabling new electrification and the resulting demand growth. Through rapid electrification of transport, demand will increase at the household and street level, having broader implications for the entire network. Process heat electrification will lead to larger, but more localised areas of step change demand, which could trigger the need for new investments. To enable electrification (primarily) and renewable generation (secondarily), a ~30% increase in distribution spend to an average of \$2.4 billion per year to 2050 is needed.⁸

Getting the settings right for electrification

29. To ensure that electricity distribution networks can support growth and variability of demand and supply, it is **imperative** that the Government gets the settings right for the electricity distribution sector. As the draft advice notes (emphasis added)⁹

Lines companies have a critical role in managing peak demand and delivering services for the long-term benefit of consumers. The regulatory system needs to provide the appropriate incentives for lines companies to manage peak demand through existing tools and to invest in other ways to manage demand, such as through batteries, distributed energy resources, or network reinforcement.

*Uncertainty about future requirements and potential solutions has increased. The existing regulated investment framework for transmission and distribution infrastructure needs to be future proof by looking to meet outcomes related to emissions reduction, system security and reliability, and affordability. **Expenditure forecasting approaches and allowable revenues for lines companies need to be able to support the accelerated pace of investment in generation and electrification that is required.** Physical grid capacity must keep pace with generation build. Control and operation of the grid also needs to evolve as generation becomes more distributed and digitisation increases.*

⁷ See page 8

⁸ See page 61.

⁹ See pages 114 to 115.

Realising the vision of an electrified economy could require an investment of over \$40 billion by 2030 across generation, transmission, and distribution infrastructure providers to address historical under-investment, meet future needs, and strengthen grid resilience.

30. The regulatory system comprises the rules set by the Commerce Commission under Part 4 of the Commerce Act 1986¹⁰ as well as the rules set by the Electricity Authority through the Electricity Industry Participation Code, together with other rules and regulations made by the Government controlling and influencing aspects of the electricity distribution sector. Overall, there are a complex set of arrangements governing the sector.

DPP4 Reset

31. As you will be aware, the current default price quality path for electricity distribution businesses (DPP3) is due to expire on 31 March 2025. The Commerce Commission must make a decision on the next default price-quality path to apply (DPP4) by 30 November 2024.

32. In addition to DPP4, the Commerce Commission is also reviewing the Information Disclosure requirements for electricity distribution businesses, as well as the Input Methodologies. In terms of the Information Disclosure review, Tranche 1 of the review is complete and the Commission will work on Tranche 2 this year. Tranche 2 is likely to include further work in the areas of quality of service, how local lines companies are preparing for decarbonisation and asset management.

33. In terms of the Input Methodologies review, the Commerce Commission released its draft determination on 14 June 2023. In its paper, “*Context and summary of Draft decisions*”, the Commission acknowledges the impacts of decarbonisation on regulated businesses and the need for greater resilience due to climate change.¹¹

34. As we see it, DPP4 will be critical to our decarbonisation journey. Without the appropriate level of authorised expenditure EDBs subject to price quality control will not be able to appropriately plan or provide for the electrification needed for decarbonisation.

35. Key to the reset of the DPP4 will be the forecast expenditure of electricity distribution businesses (EDBs). As noted above, EDB expenditure is forecast to rise given the imperative to decarbonise and deliver new services.

¹⁰ As the Commerce Commission notes, the “Part 4 purpose requires the Commission to promote the long-term benefit of consumers of regulated services. We do this by promoting the following outcomes consistent with those produced in workably competitive markets – namely, that the suppliers of these services:

- have incentives to innovate and invest, including in replacement, upgraded, and new assets;
- have incentives to improve efficiency and provide services at a quality that reflects consumer demands;
- share with consumers the benefits of efficiency gains in the supply of the regulated services, including through lower prices; and
- are limited in their ability to extract excessive profits.” (See https://comcom.govt.nz/_data/assets/pdf_file/0030/318666/Part-4-IM-Review-2023-Draft-decision-Summary-and-context-paper-14-June-2023.pdf)

¹¹ See above n 10.

36. By way of example, Orion’s forecast capital and operational expenditure for the next 10 years is set out in our Asset Management Plan 2023. We have included a graph of our forecast capital expenditure for your information to illustrate our planned growth in expenditure.



37. We have taken into account the following drivers for investment in reaching this forecast -

- Transport electrification¹²
- Housing intensification and population growth¹³
- Low voltage network impact and approach
- Industrial conversion to electricity¹⁴
- Utility scale solar generation¹⁵
- Changing customer behaviour and expectations
- Developing a smart grid
- Potential loss of hot water control
- Adapting to climate change.¹⁶

¹² Translated to the 100,000 to 300,000 EVs various government departments and crown entities are forecasting to be on Orion’s region’s roads by 2033, the kW impact per EV scales up to a total increase in peak demand of somewhere between 60MW and 100MW.

¹³ By way of example, given the strong residential growth in Selwyn district, Orion will need to invest more than \$20m in the next two years to reinforce supply to the Rolleston area.

¹⁴ Surveys we have led in partnership with others show we can expect industry conversion, primarily due to decarbonisation efforts, to add peak load of between 8% (55MW) to 33% (215MW) to our current maximum peak demand.

¹⁵ We currently have more than 680MW of utility scale solar generation being considered in Orion’s network area. As context, we have around 25MW of residential solar connected with residential solar growth being around 7MW last year.

¹⁶ The initial impacts of climate change are that our network will experience more frequent and more intense windstorms and drier conditions increasing the risk of fire.

38. In terms of our expenditure forecasting, Orion has made an educated assessment, supported wherever possible by customer and market insight, of what can be expected of our network.
39. We recognise there are significant uncertainties and assumptions built into our forecasting. Key parts of this uncertainty relate to the future load that will be required and the extent of future generation that will connect to our network, as well as where the generation connections will be made. We have attempted to account for these uncertainties in our expenditure forecasts in order to ensure that our network will be able to respond to customer demands in the future. Generally speaking, our approach is to undertake least regrets actions over the next few years that will prove useful under all possible future scenarios. However, we make the point that the regulatory regime will also need to account for these forecasting uncertainties in due course.
40. We are also taking into account and exploring flexibility and other related markets and systems. We are carrying out some work to assess possible participation in flexibility markets and the effectiveness of flexibility. An example of our work in this area is the Lincoln Flexibility trial. In November 2022, we issued a call for Expressions of Interest to emerging flexibility suppliers to seek cost effective, reliable alternative solutions to building additional network infrastructure in the Lincoln area. Our objective is to defer construction of a new zone substation and other upgrade works in the area, given load growth that is occurring in and around Lincoln.¹⁷
41. One risk that we do think needs to be addressed is the uncertainty surrounding future hot water control. One long standing way we reduce our peak loads is through financial encouragement for residential customers to only heat their hot water cylinder overnight or to allow us to briefly stop them from heating their cylinder when we are experiencing peak demand conditions. We estimate our peak load is reduced by around 150MW from this intervention. Without this, our peak load would increase from around 650MW to 800MW – around 15% more, and additional investment with the appropriate lead time would be required to support this uplift.
42. There has been some discussion about the potential loss of hot water control as part of an overall flexibility offering.¹⁸ Currently hot water control is achieved through Orion owned ripple control plant. Ripple systems are a cheap and effective means to control network and transmission peaks, however they do not easily allow an individual retailer the flexibility to reduce the hot water load of their customers when that individual retailer may want it to occur, any time of year.

Electricity Authority Regulation

43. We referred to the Electricity Authority above and note their role in the governance and regulation of the electricity industry. One of the current projects that the Authority is working on is distribution

¹⁷ We are also a member of FlexForum. Forum is a cross industry group formed to identify a set of actions to integrate distributed energy resources (DER) into the electricity system and markets to maximise the benefits for Aotearoa New Zealand. The group is focussed on gathering and sharing knowledge and facilitating collaboration on real-world trials to ensure that our energy transition can learn from and avoid some of the challenges seen internationally. See <https://www.araake.co.nz/projects/flexforum/>

¹⁸ For example, see <https://www.energynews.co.nz/news/demand-management/140310/set-and-forget-preferred-genesis-customer-trial>

pricing. As they state “*We’re working on how to speed up distribution pricing reform to realise consumer benefits and facilitate an efficient transition to a low-emissions future.*” In 2019 the Authority set out distribution pricing principles which include cost reflective pricing and its current Distribution Pricing Note¹⁹ provides further guidance on how to apply those principles.

44. Pricing and asset management investments are inextricably linked and somewhat symbiotic. Pricing can provide signals to inform customer behaviour that can influence utilisation and constraints on the network that may lead to additional infrastructure investment (a key cost driver). Infrastructure investment and operating expenditure will, over time, be reflected in changes in real prices that customers pay, and the quality of supply they receive. We are committed to managing and operating our network to deliver electricity safely and reliably so that it meets consumers’ expectations now and in a decarbonised future. Cost reflective pricing gives us the foundation to support New Zealand’s decarbonised future by signalling the impact of network use on consumers today and in the future.
45. The Electricity Authority, at the end of 2022, also published an issues paper for consultation called “*Updating the Regulatory Setting for Distribution Networks*”. The paper sought views and feedback on how regulatory settings can support distribution networks with the uptake of non-network solutions and flexibility services. Orion made a submission on this paper and we await the outcome of this consultation process.²⁰ In this respect we note that the Authority has stated that the next steps will be developing a prioritised list of well-understood issues to be progressed over the next 18 months to two years, with some high-priority tasks to begin in the current year. That said, overall, it will be desirable for the Authority to push on with this project and provide some certainty to the sector about the regulatory arrangements that will be put in place.

Other matters

46. We also have a strong focus on building our understanding of evolving drivers of change in our region and emerging solutions, to support robust investment decisions which enable our customers affordable access to the energy services they require. This year, Orion is working towards developing a set of future energy scenarios for use in planning for long term changes due to decarbonisation. We are also establishing a new demand modelling approach that will allow for more granular levels of assumptions about the different forecast areas, allowing us to test multiple inputs in scenarios. This will integrate with our network development planning for future AMPs.
47. We have also looked into the process heat conversions that will be required for central Canterbury. To discover the likely extent of future electrical conversion, Orion engaged DETA Consulting in 2021 to identify and survey large thermal fuel boiler sites within the Orion region. DETA, in partnership with Orion and with the support of other key stakeholders Transpower, MBIE and EECA, discussed with each business the size of their loads and forecast what they were likely to convert to electricity or biomass. In May 2022 this work estimated 55MW to 215MW of commercial and industrial load is likely to convert to electricity by 2035. The range of expected load conversions is due to uncertainty in the availability of

¹⁹ See <https://www.ea.govt.nz/documents/1875/Distribution-Pricing-Practice-Note-v-2.2-October-2022.pdf> There was an updated distribution pricing principles document in 2021 and it was amended in 2022.

²⁰ See <https://www.oriongroup.co.nz/assets/Company/Submissions/EA-Feedback-on-Issues-Paper-Updating-the-Regulatory-Settings-for-Distribution-Networks.pdf>

biomass in commercial quantities in Central Canterbury. Virtually no biomass is produced locally.

48. For current purposes, our forecasts for expenditure are based on a midpoint of 135MW for process heat conversions. Furthermore, we are working closely with the business owners identified in our study to find pathways to decarbonise their process heat systems and better understand their likely electrical requirements and timing.
49. We are also waiting to see what happens with the expanded GIDI funding²¹. As part of budget 2022, the Government announced that there would be GIDI funding for electricity transmission and distribution infrastructure upgrades to support fuel-switching, and the early adoption of high decarbonisation energy technologies.²² New Zealand Green Investment Finance is also potentially providing finance for network upgrades as another alternative financing vehicle.²³ That said, there still needs to be better access to innovation funding to support development of non-network solutions and the capability to utilise them.²⁴ We see this as a critical gap in that there is a strong need for innovation funding to support the exploration of complex challenges in the sector. (An example of one challenge is when there is a high level of distributed energy resources (DER).²⁵ There will need to be a level of dynamic control to maintain the balance between load and generation and keep the network stable. Achieving this level of dynamic control is complex and more funding is required to enable networks to collaboratively explore how to effectively achieve this in a way that maintains security, while unlocking value to consumers.)
50. Consequently, better funding will foster the development of collaborative solutions and shared insights between the sector, customers and flexibility providers.

Ensuring that EDB networks can support the growth and variability of supply and demand (includes consenting and network planning).

51. The draft advice refers to the need for stronger direction for the consenting system to remove barriers to building new renewable generation or re-consenting existing generation. It also refers to the delays in implementation at page 113

Resource management system reform is underway, but existing processes will remain in place across the second and third emissions budget periods as the system transitions. The lengthy transition period, uncertainty around currently unspecified environmental limits, and the potential provision of exemptions could create additional uncertainty that delays renewable generation build. A simplified or streamlined consenting process that makes renewable build easier and quicker is needed by the start of the second emissions budget period, if not earlier.

²¹ Government Investment in Decarbonising Industry Fund.

²² See press release from Hon. Megan Woods and Hon. James Shaw at <https://www.beehive.govt.nz/release/supercharging-decarbonisation-transforming-energy-system>

²³ See <https://nzgif.co.nz/>

²⁴ See https://www.linkedin.com/posts/flexforum_flexforum-insights-report-activity-7065076159004246016-fla5?utm_source=share&utm_medium=member_desktop FlexForum identified that

²⁵ See paragraph 63 below.

52. We agree with the statement but also make the point that there needs to be certainty in consenting for all parts of the electricity sector – not just renewable generation.
53. Furthermore, Orion is also concerned about the time it will take to implement the Natural and Built Environment Bill and the Spatial Planning Bill, once these Bills are passed by Parliament. It is likely to be a 10-year process as we wait for the National Policy Framework to be developed, regional planning committees to be appointed, regional spatial strategies to be drafted and finally Natural and Built Environment plans to be prepared. All of this will be a staged approach as not all regions will start together.²⁶
54. Our concern is that a 10-year implementation process is simply too long, and it will hamper the large investment that is needed in the sector. The RMA will continue to apply in the meantime. The challenges in the current RMA system that have been identified by the Ministry for the Environment will likely continue for another 10 years and as the Commission points out, across the second and third emissions period.²⁷ We do not think we have the luxury to wait approximately 10 years to see the benefit of RMA reforms.
55. We acknowledge that the Government is currently consulting on strengthening national direction on renewable electricity generation and electricity transmission (which will lead to a new national policy statement). We also note that the Government is interested in comments on whether electricity transmission provisions that apply to the national grid should be extended to also cover high-voltage transmission lines not owned and operated by the national grid. We have made a submission advocating that high-voltage transmission lines should also include subtransmission 33kV and 66kV lines.²⁸

Access to and visibility of electricity information

56. One aspect that does not receive specific consideration in the draft advice relates to access to, and visibility of, electricity information. Whilst the draft advice refers to lines companies managing peak demand through existing tools and investing in other ways to manage demand, such as through batteries, DER, or network reinforcement,²⁹ the advice does not refer to electricity information visibility or the necessity for regulatory changes to provide for access. Orion's position is that this is an important aspect that needs to be factored in and deserves a specific recommendation as mentioned above. We have set out below some more information about this so that you can gain a fuller understanding of the

²⁶ See our submissions to the Environment Select Committee on the Natural and Built Environment Bill and the Spatial Planning Bill at <https://www.oriongroup.co.nz/corporate/submissions/ministry-for-the-environment>

²⁷ These challenges include cumulative environmental effects not being well managed; resource management plans have restricted housing and infrastructure needed in response to population growth; the lack of integration across the system, resulting in inefficiencies and delays; insufficient recognition of te Tiriti o Waitangi and lack of support for Māori participation; and the need to urgently reduce carbon emissions and adapt to climate change.

²⁸ See <https://www.oriongroup.co.nz/assets/Company/Submissions/Orion-Submission-on-strengthening-national-direction-for-electricity-transmission.pdf>

²⁹ See page 114, and also page 115 which refers to DER and demand side management helping to manage the variability of supply from an increasingly renewable electricity system.

importance of this information.

57. The Electricity Authority's consultation on the issues paper "*Updating the Regulatory Setting for Distribution Networks*" specifically looked at equal access to data and information. In particular, the Authority considered access to historical non-aggregated ICP-level Consumption Data and Power Quality data, visibility of location, size, and functionality of (non-exporting) Distributed Energy Resources (DER) installed on LV networks, real-time non-aggregated Consumption Data and Power Quality Data. The Authority asked about the priority that should be given to this data.
58. Our view is that high priority needs to be given to at least the first two aspects of this data. Especially, to enable DER visibility as this is not easy to predict and forecast. Early issues and clusters have a disproportionately high impact on networks due to the lack of diversity. Issues arising from this could impact public trust and slow down decarbonisation. It is important that we remain ahead of the 'S curve' of technology adoption as it takes time to procure flexibility services and implement network upgrades. Without early visibility and identification of trends through access to data, networks risk becoming a barrier to decarbonisation.
59. Visibility of network information leads to better detection and location of faults. In addition, it also allows for more accurate planning and expenditure forecasts. Customers are also requesting this data as they are asking us for current and forecast data on network capacity and headroom. This data underpins our load growth maps which we provide to assist customers in their planning.³⁰
60. Monitoring data can inform actions that optimise network utilisation and reduce line losses, and better performance of the network overall. Furthermore, measuring power quality in low voltage (LV)³¹ networks makes it possible to address issues as they are identified. Improved power quality reduces losses and thereby enhances the effective capacity in the networks so capital expense of additional network capacity can be avoided.³²
61. At present, Orion has good visibility and control of our high voltage network through use of SCADA-enabled field devices at most circuit breakers and zone substations. This data is used to assess asset utilisation and performance to inform our network investment. However, this is not the case with our LV network which were planned for reasonably stable passive household loads with one-way power flow. As more customers adopt technologies such as solar PV, EVs, batteries, and as more multi-unit housing intensification occurs, these street-level low voltage systems are expected to experience increasing levels of constraint.

³⁰ See the Orion load growth map on our website- <https://www.oriongroup.co.nz/customers/connecting-your-solar-or-diesel-generation/load-growth-map/>- that shows the respective load growth capacity within Orion's network for 2024 - 2028.

³¹ The Low Voltage (LV) network refers to the assets of distribution companies which carry power from distribution transformers to the electricity meters of industrial, commercial and residential customers. In New Zealand, LV networks are operated at 230 volts (single-phase) and 400 volts (three-phase) plus or minus 6 per cent, at the frequency of 50 hertz.

³² See Sapere Report Low Voltage Monitoring Primer and Guideline David Reeve and Ben Barton October 2020

62. Our position is that given Orion's low voltage network supplies more than 99% of our customers, developing its visibility and capability is essential to efficient management of our network and facilitating customer choice. LV monitoring will enable us to observe the use of power in near real time, at street level. This low voltage monitoring samples power flows and voltage at 10-minute intervals, generating a wealth of data that will allow us to see and respond to changes of activity on the network. Having visibility of how our network is being used at this granular level helps us to provide customers with a more flexible, dynamic range of choices for managing their energy needs.³³
63. We also note that growth in DER will result in active networks, characterised by bi-directional power flow, variable voltage profiles and less predictable loads. Where there is a high level of DER, a level of dynamic control will be needed to maintain the balance between load and generation and keep the network stable. In other words, there will need to be coordination across the whole electricity system, from the system operator (Transpower) to consumers.
64. To do so, real-time information on the current state of the network is likely required. Understanding how demand profiles are changing and having clear visibility of power flows and quality across the LV distribution network will enable EDBs to identify and locate technical and nontechnical losses and quickly manage or resolve issues.

Recommendation 15

65. Recommendation 15 in relation to forests is as follows:

15. Set and implement integrated objectives for the role of forests with respect to emissions mitigation and adaptation, while giving effect to the principles of the Te Tiriti o Waitangi / The Treaty of Waitangi.

66. We fully support this recommendation.

³³ With that background in mind, in FY20, we began a 10-year programme to install LV transformer and feeder monitoring at selected sites. We revised this programme in FY21 to target a smaller group of high-risk sites with an accelerated completion in FY26 based on constraint modelling conducted in partnership with the Electric Power Engineering Centre (EPECentre) at the University of Canterbury. In FY22, we installed 202 LV monitors, with our total fleet now covering approximately 26,000 customer connections. Analysing the data from these monitors is enabling us to develop a better understanding of baseline LV demand and will enable us to see how it changes as adoption of EVs, solar PV, battery storage and energy sharing become more prevalent, and patterns in customer behaviour emerge. In the long-term, we aim to use this data to monitor trends and demand profiles at the LV feeder level to inform our investment decisions. We are already beginning to use this data to initiate network upgrades in certain areas.

Key theme from this Recommendation

We want to encourage native forestry

67. The draft advice refers to the current lack of clear direction and objectives for the amount and type of forestry required to achieve the 2050 target.
68. The draft advice notes that exotic forests generally sequester carbon from the atmosphere much faster than native forests, but the sequestration rate of some exotic species also declines sooner. It also notes that native forests can continue to sequester carbon for hundreds of years, giving the opportunity to create long-term carbon sinks. It goes on to state that all forms of forests support emissions reductions and can provide environmental benefits including the management of water quality, air quality, and stabilisation of land to manage erosion. Native forests in particular can provide the opportunity to build an enduring carbon sink beyond 2050 and have added cultural and biodiversity benefits.
69. We agree that there is an opportunity for the Government to articulate the role of forests and other emissions removals, and how they will contribute to achieving emissions budgets and targets. And that if the role of forests is clearly articulated, other policies can be aligned.
70. We also agree that it is important that other outcomes besides carbon removals are considered when defining the role of forests.³⁴ There are significant benefits to the reversion and planting of native forests, including enhancing native biodiversity, and better social and cultural outcomes. For example, native planting is more likely to uphold the principles of Te Taiao and Tiakitanga under the He Ara Waiora framework.
71. In 2020, we committed to achieving carbon neutrality for our group corporate emissions by June 2022. As part of this we proposed that Orion would partner with local landowners to plant an area of native forest of at least 200ha in at least two locations around our region.
72. At present we have partnered with two parties in respect reforestation (native forest establishment). One partnership is for a 14 hectare parcel on Banks Peninsula Te Pataka o Rakaihautū. Earlier this year we entered into a partnership agreement with Te Kete o Wairewa, the legal entity of the Wairewa Rūnanga. We have signed an agreement to reforest Te Kaio farm, a 280-hectare block of ex-farmland belonging to the Rūnanga.
73. The partnership agreement involves Orion Group bringing forestry expertise, capital, and personnel to the project, with Te Kete o Wairewa, supplying the land, as well as a mātauranga Māori lens. The vision for the land is that for the next 35 years native species will be established to restore the whenua, adding to significant local efforts to return the Peninsula to its former forested state. Both parties will enter the carbon farming market together and receive a share of the carbon issued via the New Zealand Emissions Trading Scheme. When the 35-year contract ends, carbon credits from the ngahere – with trees like

³⁴ See <https://www.oriongroup.co.nz/corporate/latest-news/orion-and-mana-whenua-team-up/> and <https://www.oriongroup.co.nz/corporate/latest-news/data-gathering-hikoi/> and <https://www.stuff.co.nz/pou-tiaki/131207488/banks-peninsula-farmland-to-return-to-native-forest-bringing-carbon-credit-income-and-healing-for-mana-whenua>

totara, matai and kahikatea that can live for 500 years – will be a passive income solely for the hapū.

74. Together with the Commission’s proposed recommendations in relation to New Zealand Emissions Trading Scheme, we agree the Government must give clear direction on
- the quantity of removals desired over the second and third emissions budgets
 - expected planting rates over the second and third emissions budgets
 - the role of forests in the transition to a low emissions economy
 - the types of forests to be used in different contexts and for different purposes.

75. In this respect, we support particular emphasis being placed on native forestry.

Recommendations 17 and 18

76. Two of the recommendations that the Commission is proposing in relation to Transport are

17. *Rapidly resolve the barriers to scaling up vehicle charging infrastructure.*
18. *Develop incentives to accelerate the uptake of zero emissions commercial vehicles, including vans, utes and trucks.*

77. Orion **somewhat supports** these recommendations but submits that the recommendations should be amended as follows:

17. *Rapidly resolve the barriers to scaling up vehicle charging infrastructure **using smart solutions.***
18. *Develop **integrated policies and** incentives to accelerate the uptake of zero emissions commercial vehicles, including vans, utes and trucks.*

78. Below, we provide some more information on various aspects of the draft advice as set out on pages 141 to 146.

Key Themes from these Recommendations

Scaling up EV Charging Infrastructure

79. For the most part we agree with the discussion in Chapter 11 as it relates to Transport. However, we would like to provide some clarification about some of the comments made.

80. At page 143, the draft advice states that charging infrastructure, both public and private, is crucial to the success of the EV transition. We agree with this statement. EV charging infrastructure will be absolutely crucial. However, the Government needs to act quickly to get the setting right in relation to the types of chargers used. “Doing nothing” or “delaying in doing something” in relation to the regulation of EV chargers will lead to the development of charging habits that will be difficult to change, as well as the installation of poor-quality ‘dumb’ wall mounted chargers. Consequently, our submission is that recommendation 17 should be amended to refer to rapidly resolving the barriers to scaling up vehicle charging infrastructure **using smart solutions.**

81. The Discussion Document also notes

A major constraint for the public charging network and for vehicle charging depots for private companies is the capacity of electricity distribution lines. This can create a first-mover disadvantage as the first to fund installation of vehicle charging infrastructure may also need to fund the upgrade of distribution lines. This barrier is shared with electrifying process heat as discussed in Chapter 9 ...

82. The Electricity Authority is carrying out work in relation to significant first mover disadvantage issues facing customers connecting to distribution networks. We note that in an open letter from the Electricity Authority dated 19 September 2022, the Authority stated that an area of focus is electricity distributors' response to any significant first mover disadvantage (FMD) issues facing customers seeking to connect to their networks (new and expanded connections). The Authority went on to say that

The Authority expects that distributors' pricing methodologies and/or capital contribution policies will ensure that first movers and exacerbators are generally neither advantaged nor disadvantaged compared to other customers. For connection assets, we expect that:

- *In the first instance the distributor should charge the first mover based primarily on the cost required to supply them*
- *Distributors should rebate the first mover as subsequent movers connect such that the first mover and subsequent movers end up paying a share based on their comparative needs.*

We expect that distributors will consider FMD issues for upstream assets, but understand that for the 2023/24 pricing year this consideration may only feature in their roadmaps.

83. EDBs do not deliberately create barriers to slow down new connections, and connections range in complexity, cost, scale, and capacity requirements. This will be the same for installing new connections for EV charging infrastructure as the connections will differ in scale and complexity. Certainly, referring to the Orion purpose of "Powering a cleaner and brighter future with our community", and our focus area of facilitating decarbonisation and hosting capacity at lowest cost, we are keenly aware of the need to facilitate EV charging connections. By way of example, at Orion when a third-party contacts us with a view to installing EV chargers, we work with them to help determine the best location for the chargers given electrical needs. We also regularly hold conversations with business owners seeking to install EV charging in their carparks, and work with them in relation to possible options.

84. Our position is that it is useful for providers of EV chargers to engage with us early sharing their broader strategy so that we can partner with them informing about optimum locations for chargers that could reduce costs and timeframes for deployment.³⁵

85. We are currently considering our approach to FMD and connection charges. Top of mind are economic considerations of which the primary objective is the balance between socialisation (shallow charging)

³⁵ In terms of FMD and capital contributions, our capital contributions policy can be found at <https://www.oriongroup.co.nz/assets/Company/Corporate-publications/CommercialTermsNewConnectionsExtensions.pdf>

and causer pays (deep charging) in respect of the three arms of the energy trilemma- equity, sustainability and security.

86. We are also thinking about these types of matters

- applying price averaging over similar groups of connections, because it is not practical to single out individual connections for cost-specific delivery pricing;
- the life and future utilisation of new connections are not known, so the present value of future delivery charges cannot be calculated with certainty;
- the assets involved have very long lives and it may not be viable to lock customers into a contract over a matching period;
- network reinforcement is incremental - it is often more efficient for us to add large amounts of capacity at a time (unlocking economies of scale);
- As the network expands, existing customers should share in the benefit of greater utilisation of shared assets (and other enhanced economies of scale);
- some anticipatory capacity must be available before it is required to ensure that developments are not unduly delayed.

87. The draft advice notes that electric vehicles will increase residential electricity demand significantly. It goes on to say that the best way to manage this is by requiring smart charging that ensures charging is done at off-peak times of the day (ordinarily overnight), and in as efficient a manner as possible.

88. We largely agree. For our planning purposes, we are anticipating that around 85% to 90% of EV charging will occur at home in our network area, and the vast majority of this will be off-street charging.³⁶ When drivers will charge their EVs at home is a critical factor in estimating the impact of EVs on our network. Electricity networks worldwide are anticipating a significant portion of EVs will charge up in the early evening when drivers get home from work. However, the data we have demonstrates that the majority of owners in our area are charging their EVs after 9pm. Consequently, we have a different perspective, based on the latest information coming through from international and New Zealand sources. Through clever pricing, education, and flexibility offerings in collaboration with the sector, we believe we can encourage most EV drivers to charge up overnight (in the trough of the existing demand profile). We believe that this will significantly reduce the effect of EVs adding to our network peak demand and optimise infrastructure investment, but care will be needed to avoid creating new peaks on the low voltage network.

89. Therefore, we think there will need to be a range of measures that will need to be enabled when there

³⁶ We acknowledge that there may be some difficulties in the hilly suburbs of Christchurch which preclude residential off-street parking.

is significant growth in EVs and we have been looking at different ways we can achieve this³⁷. For example, we have initiated and partnered with Wellington Electricity on an innovative project called Resi-flex, to explore ways to encourage 'flexibility' from residential consumers, through commercial mechanisms with flexibility suppliers (such as retailers and aggregators). Consumer research and flexibility stakeholder engagement through the project has reinforced the importance of consumer education, choice, and ease of use to maximise participation in flexibility. This year we expect to partner with flexibility suppliers to trial various commercial mechanisms and customer offerings, such as 'smart' tariffs to assess how effectively we can minimise stress on the electricity network, while meeting consumer's needs.

Decarbonising freight and commercial vehicles

90. We agree that there needs to be incentives to accelerate the uptake of zero emissions commercial vehicles, including vans, utes and trucks.
91. In 2021, the Sustainable Business Council released a report outlining a low carbon freight pathway³⁸ The report noted that by 2030, 28% of net emissions reductions can be achieved through options that are readily available. These include improved vehicle efficiencies, telemetrics, battery-powered electric vehicles, freight flow optimisation, and mode shift. The report went on to say that these opportunities could be harnessed through improved collaboration across the heavy vehicle supply chains, a better understanding of customer demand drivers, and government support to bring some of the required changes forward (e.g. BEV infrastructure, coastal shipping and rail infrastructure). The report also noted that the remainder of emissions will require an increasing uptake of biofuels or hydrogen, especially from 2030.
92. We agree there needs to be Government support to bring about some of the changes required. By way of example, given the delays in sourcing electric vehicles from overseas (we understand there is at least a 6-8 month wait on heavy electric vehicles out of China and longer timeframes for similar vehicles out of Europe), we suggest that Government support for securing the supply of electric vehicles (if possible) would be an excellent enabler for the heavy vehicle fleet transition.
93. However, we also think that the Government will need to investigate **policies** as well as incentives for all aspects of this uptake. Policies and incentives will need to be integrated to have meaningful impact.

³⁷ In our response to the [Market Development Advisory Group Options Paper](#) on Price Discovery in a Renewables based Electricity System, we commented on the need for innovation funding to enable collaborative exploration and co-design of solutions before standardising approaches and scaling successful solutions. We recognise the value of the FlexForum and ENA in driving progress across electricity networks and the energy sector through the identification of priority issues and coordination of action, such as the FlexForum's [Flexibility](#) Plan. As well as seeking to minimise stress on the electricity network, these groups are taking a customer-centric approach and aiming to maximise the value of distributed energy resources (including electric vehicles) to homes, businesses, and the wider energy system.

³⁸ See <https://sbc.org.nz/low-carbon-freight-pathway/> The Sustainable Business Council also noted that "... we assume that 80% of the medium fleet (mostly charging at base) can be electrified by 2035, and 5% of the heavy fleet is electrified by 2035. We believe this is conservative, particularly in relation to emissions savings, but still requires upgrading over half the fleet to EVs."

94. In this respect we refer to the recent Ministry of Transport/ MBIE consultation documents for *Charging our future: a draft long-term electric vehicle charging strategy for Aotearoa New Zealand*. On page 31 of the *Charging our Future* Discussion Document, it notes that many truck depots may need to have higher capacity electricity connections installed to support the higher electricity demand from EV charging. In many cases, there may need to be upgrades to electricity distribution or transmission networks to support the additional demand too.

95. We also note the comments of the IEA in its summary of global EV outlook in 2022 where it stated that³⁹

Very fast charging on highways will be needed to provide flexibility and autonomy for regional and long-haul electric trucks. Given the high construction and grid integration costs, the business case for very fast charging infrastructure of more than 350 kilowatts (kW), or even more than 1 megawatt (MW), may be uncertain, especially in the initial years of electric HDV market deployment. This uncertainty coupled with long lead times and investment requirements needed for HDV megawatt charging capacity along transport corridors are challenges. Policies and measures to support the development of charging networks, may have an important influence in the timely roll out of charging infrastructure for EVs including HDVs. Strategic planning is required to optimise the design and development to be compatible with HDV operational needs. Co-ordinated roll out will need to focus first on the most heavily used freight corridors.

96. We note that *Charging our future: a draft long-term electric vehicle charging strategy for Aotearoa New Zealand* did not go so far as to specify policies and actions in relation to supporting the transition to, and use of, low-emissions transport modes across the wider transport system. (It did propose researching and engaging with the sector to understand how a public journey charging network for heavy vehicles might look.) Well thought out policies and incentives to accelerate the uptake of zero emissions commercial vehicles, including vans, utes and trucks, as well as coordinated implementation will be key. The electricity distribution sector will need to work together with Government and the transport sector to ensure that we can facilitate the successful uptake of electric commercial vehicles, including vans, utes and trucks.

Future decarbonisation of aviation

97. Finally, we note that on page 147 of the draft advice it refers to introduction of zero or low emissions aircraft – for example, battery electric or hydrogen fuel – anticipated in Aotearoa New Zealand during the third emissions budget, servicing short or medium haul routes. The advice goes on to state that it is important that regulations are developed during the second emissions budget to enable this.

98. Electrification of aviation could require substantial development of distribution networks. Work needs to start sooner rather than later in planning for future system wide charging needs. We refer back to our comments on getting the settings right for electrification at pages 7 to 15 of this submission.

³⁹ See <https://www.iea.org/reports/global-ev-outlook-2022/trends-in-electric-heavy-duty-vehicles#abstract>

Concluding comments

99. Thank you again for the opportunity to provide this submission. If you have any questions about our comments, please get in touch as we are more than happy to discuss with you. The contact for this submission is Vivienne Wilson, vivienne.wilson@oriongroup.co.nz; and phone 027 202 2718.

Yours sincerely



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